

Planning Resource for Grade 3/4

Continuum of Mathematics Expectations

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NUMBER SENSE AND NUMERATION

1. Quantity Relationships

Grade 3	Grade 4
Overall Expectation	
- read, represent, compare, and order whole numbers to 1000, and use concrete materials to represent fractions and money amounts to \$10	- read, represent, compare, and order whole numbers to 10 000, decimal numbers to tenths, and simple fractions, and represent money amounts to \$100
Specific Expectations	
- read and print in words whole numbers to one hundred, using meaningful contexts	- read and print in words whole numbers to one thousand, using meaningful contexts
- represent, compare, and order whole numbers to 1000, using a variety of tools	- represent, compare, and order whole numbers to 10 000, using a variety of tools
	- represent, compare, and order decimal numbers to tenths, using a variety of tools and using standard decimal notation
- identify and represent the value of a digit in a number according to its position in the number	- demonstrate an understanding of place value in whole numbers and decimal numbers from 0.1 to 10 000, using a variety of tools and strategies
- compose and decompose three-digit numbers into hundreds, tens, and ones in a variety of ways, using concrete materials	
- represent and explain, using concrete materials, the relationship among the numbers 1, 10, 100, and 1000	
- solve problems that arise from real-life situations and that relate to the magnitude of whole numbers up to 1000	- solve problems that arise from real-life situations and that relate to the magnitude of whole numbers up to 10 000
- round two-digit numbers to the nearest ten, in problems arising from real-life situations	- round four-digit whole numbers to the nearest ten, hundred, and thousand, in problems arising from real-life situations
- represent and describe the relationships between coins and bills up to \$10	- read and represent money amounts to \$100
- estimate, count, and represent (using the \$ symbol) the value of a collection of coins and bills with a maximum value of \$10	
- divide whole objects and sets of objects into equal parts, and identify the parts using fractional names, without using numbers in standard fractional notation	- represent fractions using concrete materials, words, and standard fractional notation, and explain the meaning of the denominator as the number of the fractional parts of a whole or a set, and the numerator as the number of fractional parts being considered
	- demonstrate and explain the relationship between equivalent fractions, using concrete materials and drawings
	- compare fractions to the benchmarks of 0, $\frac{1}{2}$, and 1 (e.g., $\frac{1}{8}$ is closer to 0 than $\frac{1}{2}$; $\frac{3}{5}$ more than $\frac{1}{2}$)
	- compare and order fractions (i.e., halves, thirds, fourths, fifths, tenths) by considering the size and the number of fractional parts

2. Counting

Grade 3		Grade 4	
Overall Expectation			
- demonstrate an understanding of magnitude by counting forward and backwards by various numbers and from various starting points		- demonstrate an understanding of magnitude by counting forward and backwards by 0.1 and by fractional amounts	
Specific Expectations			
- count forward by 1's, 2's, 5's, 10's, and 100's to 1000 from various starting points, and by 25's to 1000 starting from multiples of 25, using a variety of tools and strategies			
- count backwards by 2's, 5's, and 10's from 100 using multiples of 2, 5, and 10 as starting points, and count backwards by 100's from 1000 and any number less than 1000, using a variety of tools and strategies			
		- count forward by halves, thirds, fourths, and tenths to beyond one whole, using concrete materials and number lines	
		- count forward by tenths from any decimal number expressed to one decimal place, using concrete materials and number lines	

3. Operational Sense

Grade 3	Grade 4
Overall Expectation	
- solve problems involving the addition and subtraction of single- and multi-digit whole numbers, using a variety of strategies, and demonstrate an understanding of multiplication and division	- solve problems involving the addition, subtraction, multiplication, and division of single- and multi-digit whole numbers, and involving the addition and subtraction of decimal numbers to tenths and money amounts, using a variety of strategies
Specific Expectations	
- solve problems involving the addition and subtraction of two-digit numbers, using a variety of mental strategies	- add and subtract two-digit numbers, using a variety of mental strategies
- add and subtract three-digit numbers, using concrete materials, student-generated algorithms, and standard algorithms	- solve problems involving the addition and subtraction of four-digit numbers, using student-generated algorithms and standard algorithms
- relate multiplication of one-digit numbers and division by one-digit divisors to real life situations, using a variety of tools and strategies	
- multiply to 7×7 and divide to $49 \div 7$, using a variety of mental strategies	- multiply to 9×9 and divide to $81 \div 9$, using a variety of mental strategies
	- solve problems involving the multiplication of one-digit whole numbers, using a variety of mental strategies
	- multiply whole numbers by 10, 100, and 1000, and divide whole numbers by 10 and 100, using mental strategies
	- multiply two-digit whole numbers by one-digit whole numbers, using a variety of tools, student-generated algorithms, and standard algorithms
	- divide two-digit whole numbers by one-digit whole numbers, using a variety of tools and student-generated algorithms
- use estimation when solving problems involving addition and subtraction, to help judge the reasonableness of a solution	- use estimation when solving problems involving the addition, subtraction, and multiplication of whole numbers, to help judge the reasonableness of a solution
	- add and subtract decimal numbers to tenths, using concrete materials and student-generated algorithms
- add and subtract money amounts, using a variety of tools, to make simulated purchases and change for amounts up to \$10	- add and subtract money amounts by making simulated purchases and providing change for amounts up to \$100, using a variety of tools

4. Proportional Relationships

Grade 3		Grade 4	
Overall Expectation			
		- demonstrate an understanding of proportional reasoning by investigating whole-number unit rates	
Specific Expectations			
		- describe relationships that involve simple whole-number multiplication	
		- determine and explain, through investigation, the relationship between fractions (i.e., halves, fifths, tenths) and decimals to tenths, using a variety of tools and strategies	
		- demonstrate an understanding of simple multiplicative relationships involving unit rates, through investigation using concrete materials and drawings	

MEASUREMENT

1. Attributes, Units, and Measurement Sense

Grade 3		Grade 4	
Overall Expectation			
- estimate, measure, and record length, perimeter, area, mass, capacity, time, and temperature, using standard units		- estimate, measure, and record length, perimeter, area, mass, capacity, volume, and elapsed time, using a variety of strategies	
Specific Expectations			
- estimate, measure, and record length, height, and distance, using standard units (i.e., centimetre, metre, kilometre)		- estimate, measure, and record length, height, and distance, using standard units (i.e., millimetre, centimetre, metre, kilometre)	
- draw items using a ruler, given specific lengths in centimetres		- draw items using a ruler, given specific lengths in millimetres or centimetres	
- estimate, measure, and record the perimeter of two-dimensional shapes, through investigation using standard units		- estimate, measure using a variety of tools and strategies, and record the perimeter and area of polygons	
- estimate, measure (i.e., using centimeter grid paper, arrays), and record area			
- choose benchmarks for a kilogram and a litre to help them perform measurement tasks			
- estimate, measure, and record the mass of objects using the standard unit of the kilogram or parts of a kilogram		- estimate, measure, and record the mass of objects, using the standard units of the kilogram and the gram	
- estimate, measure, and record the capacity of containers, using the standard unit of the litre or parts of a litre		- estimate, measure, and record the capacity of containers, using the standard units of the litre and the millilitre	
		- estimate, measure using concrete materials, and record volume, and relate volume to the space taken up by an object	
- read time using analogue clocks, to the nearest five minutes, and using digital clocks and represent time in 12-hour notation		- estimate, measure (i.e., using an analogue clock), and represent time intervals to the nearest minute	
		- estimate and determine elapsed time, with and without using a time line, given the durations of events expressed in five-minute intervals, hours, days, weeks, months, or years	
- estimate, read (i.e., using a thermometer), and record positive temperatures to the nearest degree Celsius (i.e., using a number line; using appropriate notation)			
- identify benchmarks for freezing, cold, cool, warm, hot, and boiling temperatures as they relate to water and for cold, cool, warm, and hot temperatures as they relate to air			

2. Measurement Relationships

Grade 3		Grade 4	
Overall Expectation			
- compare, describe, and order objects, using attributes measured in standard units		- determine the relationships among units and measurable attributes, including the area and perimeter of rectangles	
Specific Expectations			
- compare standard units of length (i.e., centimetre, metre, kilometre) and select and justify the most appropriate standard unit to measure length		- select and justify the most appropriate standard unit (i.e., millimetre, centimetre, decimetre, metre, kilometre) to measure the side lengths and perimeters of various polygons	
- compare and order objects on the basis of linear measurements in centimetres and/or metres in problem-solving contexts		- describe, through investigation, the relationship between various units of length (i.e., millimetre, centimetre, decimetre, metre, kilometre)	
- compare and order various shapes by area, using congruent shapes and grid paper for measuring			
- describe, through investigation using grid paper, the relationship between the size of a unit of area and the number of units needed to cover a surface			
		- determine, through investigation, the relationship between the side lengths of a rectangle and its perimeter and area	
		- pose and solve meaningful problems that require the ability to distinguish perimeter and area	
		- compare, using a variety of tools, two-dimensional shapes that have the same perimeter or the same area	
- compare and order a collection of objects, using standard units of mass (i.e., kilogram) and/or capacity (i.e., litre)		- compare and order a collection of objects, using standard units of mass (i.e., gram, kilogram) and/or capacity (i.e., millilitre, litre)	
		- select and justify the most appropriate standard unit to measure mass (i.e., milligram, gram, kilogram) and the most appropriate standard unit to measure the capacity of a container (i.e., millilitre, litre)	
		- determine, through investigation, the relationship between millilitres and litres	
		- determine, through investigation, the relationship between grams and kilograms	
- solve problems involving the relationships between minutes and hours, hours and days, days and weeks, and weeks and years, using a variety of tools		- solve problems involving the relationship between years and decades, and between decades and centuries	

GEOMETRY AND SPATIAL SENSE

1. Geometric Properties

Grade 3		Grade 4	
Overall Expectation			
- compare two-dimensional shapes and three-dimensional figures and sort them by their geometric properties		- identify quadrilaterals and three-dimensional figures and classify them by their geometric properties, and compare various angles to benchmarks	
Specific Expectations			
		- draw the lines of symmetry of two-dimensional shapes, through investigation using a variety of tools and strategies	
- identify and compare various polygons (i.e., triangles, quadrilaterals, pentagons, hexagons, heptagons, octagons) and sort them by their geometric properties (i.e., number of sides; side lengths; number of interior angles; number of right angles)		- identify and compare different types of quadrilaterals (i.e., rectangle, square, trapezoid, parallelogram, rhombus) and sort and classify them by their geometric properties	
– construct rectangular prisms, and describe geometric properties (i.e., number and shape of faces, number of edges, number of vertices) of the prisms		- identify and describe prisms and pyramids, and classify them by their geometric properties (i.e., shape of faces, number of edges, number of vertices), using concrete materials	
– compare and sort prisms and pyramids by geometric properties (i.e., number and shape of faces, number of edges, number of vertices), using concrete materials			
– use a reference tool to identify right angles and to describe angles as greater than, equal to, or less than a right angle		- identify benchmark angles (i.e., straight angle, right angle, half a right angle), using a reference tool and compare other angles to these benchmarks	
– compare various angles, using concrete materials and pictorial representations, and describe angles as bigger than, smaller than, or about the same as other angles		– relate the names of the benchmark angles to their measures in degrees	

2. Geometric Relationships

Grade 3	Grade 4
Overall Expectation	
- describe relationships between two-dimensional shapes, and between two-dimensional shapes and three-dimensional figures	- construct three-dimensional figures, using two-dimensional shapes
Specific Expectations	
- solve problems requiring the greatest or least number of two-dimensional shapes needed to compose a larger shape in a variety of ways	
- identify congruent two-dimensional shapes by manipulating and matching concrete materials	
- explain the relationships between different types of quadrilaterals	
	- construct a three-dimensional figure from a picture or model of the figure, using connecting cubes
- identify and describe the two-dimensional shapes that can be found in a three dimensional figure	- construct three-dimensional figures, using only congruent shapes
- describe and name prisms and pyramids by the shape of their base	- construct skeletons of three-dimensional figures, using a variety of tools, and sketch the skeletons
	- draw and describe nets of rectangular and triangular prisms
	-construct prisms and pyramids from given nets

3. Location and Movement

Grade 3	Grade 4
Overall Expectation	
- identify and describe the locations and movements of shapes and objects	- identify and describe the location of an object, using a grid map, and reflect two-dimensional shapes
Specific Expectations	
– describe movement from one location to another using a grid map	- identify and describe the general location of an object using a grid system
– identify flips, slides, and turns, through investigation using concrete materials and physical motion, and name flips, slides, and turns as reflections, translations, and rotations	- identify, perform, and describe reflections using a variety of tools
– complete and describe designs and pictures of images that have a vertical, horizontal, or diagonal line of symmetry	– create and analyse symmetrical designs by reflecting a shape, or shapes, using a variety of tools, and identify the congruent shapes in the designs

PATTERNING & ALGEBRA

1. Patterns and Relationships

Grade 3		Grade 4	
Overall Expectation			
- describe, extend, and create a variety of numeric patterns and geometric patterns		- describe, extend, and create a variety of numeric and geometric patterns, make predictions related to the patterns, and investigate repeating patterns involving reflections	
Specific Expectations			
- identify, extend, and create a repeating pattern involving two attributes, using a variety of tools			
- demonstrate, through investigation, an understanding that a pattern results from repeating an action, repeating an operation, using a transformation, or making some other repeated change to an attribute			
- create a number pattern involving addition or subtraction, given a pattern represented on a number line or a pattern rule expressed in words		- create a number pattern involving addition, subtraction, or multiplication, given a pattern rule expressed in words	
- identify and describe, through investigation, number patterns involving addition, subtraction, and multiplication, represented on a number line, on a calendar, and on a hundreds chart			
- extend repeating, growing, and shrinking number patterns		- extend, describe, and create repeating, growing, and shrinking number patterns	
		- connect each term in a growing or shrinking pattern with its term number, and record the patterns in a table of values that shows the term number and the term	
- represent simple geometric patterns using a number sequence, a number line, or a bar graph		- make predictions related to repeating geometric and numeric patterns	
		- extend and create repeating patterns that result from reflections, through investigation using a variety of tools	

2. Expressions and Equality

Grade 3		Grade 4	
Overall Expectation			
- demonstrate an understanding of equality between pairs of expressions, using addition and subtraction of one- and two-digit numbers		- demonstrate an understanding of equality between pairs of expressions, using addition, subtraction, and multiplication	
Specific Expectations			
- determine, through investigation, the inverse relationship between addition and subtraction		- determine, through investigation, the inverse relationship between multiplication and division	
- identify, through investigation, and use the associative property of addition to facilitate computation with whole numbers		- identify, through investigation and use the commutative property of multiplication to facilitate computation with whole numbers	
		- identify, through investigation , and use the distributive property of multiplication over addition to facilitate computation with whole numbers	
- identify, through investigation, the properties of zero and one in multiplication (i.e., any number multiplied by zero equals zero; any number multiplied by 1 equals the original number)			
- determine, the missing number in equations involving addition and subtraction of one- and two-digit numbers, using a variety of tools and strategies		- determine the missing number in equations involving multiplication of one- and two-digit numbers, using a variety of tools and strategies	

DATA MANAGEMENT & PROBABILITY

1. Collection and Organization of Data

Grade 3	Grade 4
Overall Expectation	
- collect and organize categorical or discrete primary data and display the data using charts and graphs, including vertical and horizontal bar graphs, with labels ordered appropriately along horizontal axes, as needed	- collect and organize discrete primary data and display the data using charts and graphs, including stem-and-leaf plots and double bar graphs
Specific Expectations	
– demonstrate an ability to organize objects into categories, by sorting and classifying objects using two or more attributes simultaneously	
– collect data by conducting a simple survey about themselves, their environment, issues in their school or community, or content from another subject;	- collect data by conducting a survey or an experiment to do with themselves, their environment, issues in their school or the community, or content from another subject, and record observations or measurements
– collect and organize categorical or discrete primary data and display the data in charts, tables, and graphs (including vertical and horizontal bar graphs), with appropriate titles and labels and with labels ordered appropriately along horizontal axes, as needed, using many-to-one correspondence	- collect and organize discrete primary data and display the data in charts, tables, and graphs (including stem-and-leaf plots and double bar graphs) that have appropriate titles, labels, and scales that suit the range and distribution of the data, using a variety of tools

2. Data Relationships

Grade 3	Grade 4
Overall Expectation	
- read, describe, and interpret primary data presented in charts and graphs, including vertical and horizontal bar graphs	- read, describe, and interpret primary data and secondary data presented in charts and graphs, including stem-and-leaf plots and double bar graphs
Specific Expectations	
– read primary data presented in charts, tables, and graphs (including vertical and horizontal bar graphs), then describe the data using comparative language, and describe the shape of the data	- read, interpret, and draw conclusions from primary data from secondary data presented in charts, tables, and graphs (including stem-and-leaf plots and double bar graphs)
- interpret and draw conclusions from data presented in charts, tables, and graphs	- describe the shape of a set of data across its range of values, using charts, tables, and graphs
	- compare similarities and differences between two related sets of data, using a variety of strategies
– demonstrate an understanding of mode, and identify the mode in a set of data.	- demonstrate, through investigation, an understanding of median and determine the median of a set of data

3. Probability

Grade 3	Grade 4
Overall Expectation	
- predict and investigate the frequency of a specific outcome in a simple probability experiment	- predict the results of a simple probability experiment, then conduct the experiment and compare the prediction to the results
Specific Expectations	
– predict the frequency of an outcome in a simple probability experiment or game, then perform the experiment, and compare the results with the predictions, using mathematical language	- predict the frequency of an outcome in a simple probability experiment, explaining their reasoning; conduct the experiment; and compare the result with the prediction
- demonstrate, through investigation, an understanding of fairness in a game and relate this to the occurrence of equally likely outcomes	
	- determine, through investigation, how the number of repetitions of a probability experiment can affect the conclusions drawn